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(54) Title: **IMPROVED ELECTROPHYSIOLOGY LOOP CATHETER**

(57) Abstract: An electrophysiology catheter including control, localization, and/or fluid delivery features, and methods of using the same. One embodiment of the invention is directed to an electrophysiology catheter including a superelastic wire and a cable, and a method of controlling the catheter using the cable. Another embodiment is directed to an electrophysiology catheter including an adhesive to bias the orientation of the catheter. A further embodiment is directed to an electrophysiology catheter including adhesive and one or more cables, and a method of controlling the catheter using the one or more cables. Another embodiment is directed to a method including acts of injecting a fluid into the heart of a patient and adjusting the diameter of an arcuate curve of the catheter. Further embodiments are directed to a catheter having multiple position sensors on an arcuate curve of the catheter, or a position sensor associated with a movable electrode of the catheter.

INTERNATIONAL SEARCH REPORT

National Application No
PCT/US 03/34828

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B18/14 A61M25/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61B A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/37723 A (BOSTON SCIENT LTD) 31 May 2001 (2001-05-31)	1,2,4,5, 7-10,14, 15
Y	page 9, line 11 -page 23, line 19; figures ---	3
Y	DE 38 19 372 C (ZEIHER ANDREAS) 4 January 1990 (1990-01-04) column 2, line 13-22 column 3, line 28 -column 4, line 42; figures 4-8 ---	3
X	US 2001/039413 A1 (BOWE WADE A) 8 November 2001 (2001-11-08)	1,5,6, 12,14,15
A	paragraphs '0041!, '0046!-'0068!; figures --- -/--	2-4, 8-11,13

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the International filing date
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- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the International filing date but later than the priority date claimed

- *T* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/34828

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 931 811 A (HAISSAGUERRE MICHEL ET AL) 3 August 1999 (1999-08-03) column 2, line 66 -column 3, line 67; figures 1-3 ---	1,13,14, 74,75, 81,82, 85,86, 88,95, 96,99
X	US 6 126 654 A (HORZEWSKI MICHAEL ET AL) 3 October 2000 (2000-10-03) column 8, line 40-49 column 9, line 31-41 column 10, line 1-33 column 11, line 60 -column 12, line 27 column 16, line 13-21; figures 1,2,10,11 ---	74,75, 78-90, 95,96,99 91-94 76,77, 97,98, 100,101
Y	US 5 865 800 A (MIRARCHI THOMAS F ET AL) 2 February 1999 (1999-02-02) column 5, line 48-67 ---	91-94
X	US 5 334 168 A (HEMMER CHAD G) 2 August 1994 (1994-08-02) column 1, line 14-17,52-68 column 4; line 57-64; figures ---	74,75, 78-90, 95,96,99
X	US 5 329 923 A (LUNDQUIST INGEMAR H) 19 July 1994 (1994-07-19) column 10, line 60 -column 11, line 16 column 12, line 63 -column 13, line 6 column 14, line 29-49 column 20, line 40-46; figures 9-16,35-41 ---	74,75, 80-82, 85-90, 95,97, 99,100
P,X	WO 02/094334 A (MEDTRONIC INC) 28 November 2002 (2002-11-28) page 15, paragraph 3 -page 20, paragraph 2; figures 1-8 ---	1-6, 8-11,13
P,X	US 2003/097128 A1 (HAYZELDEN ROBERT C) 22 May 2003 (2003-05-22) paragraphs '0032!,'0034!,'0036!,'0037!,'0040!,'0041!, '0047!,'0048!,'0053!; figures 4A,6A,7A,8-10 -----	74,75, 78-96,99

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/34828

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 44-48, 63-70
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery and therapy
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
1-15, 74-101
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-15

Electrophysiology catheter comprising a tip assembly being attached to a shaft, wherein the tip assembly includes a superelastic wire to bias the tip assembly in a first orientation

2. Claims: 16-43

Electrophysiology catheter comprising a tip assembly being attached to a shaft, wherein the tip assembly includes an adhesive cured in a configuration to bias the tip assembly in a first orientation

3. Claims: 49-57

Electrophysiology catheter comprising a biased tip assembly being attached to a shaft, and means for conducting a fluid

4. Claims: 58-62

Electrophysiology catheter comprising a biased tip assembly being attached to a shaft, wherein the tip assembly includes a plurality of position sensors

5. Claims: 71-73

Electrophysiology catheter comprising a biased tip assembly being attached to a shaft, wherein the tip assembly includes a movable electrode assembly

6. Claims: 74-101

Shaft /electrophysiology catheter comprising a channel formed of a superelastic material and shaped to bias a portion of the catheter in a first orientation

INTERNATIONAL SEARCH REPORT

Information on patent family members

Original Application No
PCT/US 03/34828

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